

## CHAPTER 4 - CURRENT AND FUTURE AVIATION TRENDS

### 4.1 INTRODUCTION

Future trends in the aviation industry are the key indicator of future airport roles and facility requirements, as well as funding needs. This chapter explores what has occurred in the aviation industry and compares national trends with activity in New Hampshire over the past ten years. This chapter also assesses national changes to both commercial aviation, including cargo activity, and general aviation. Trends in activity within the State were obtained through available data from the airports and the airport interviews that were conducted as part of the inventory process described in Chapter 2.

### 4.2 CURRENT STATE AVIATION SYSTEM

The airport system within New Hampshire is comprised of twenty-two general aviation and three commercial service airports. Ten of the airports are privately owned, public use, and eleven of the 25 airports are eligible for federal grants. Boire Field in Nashua is the only designated reliever airport in the state, and accommodates more based aircraft (400+) than any other airport in New Hampshire. Of the three commercial service airports (Manchester, Lebanon, and Pease International Tradeport), the large majority of passenger and cargo traffic is handled at Manchester. There are as many as 100 privately-owned, private use landing facilities (airports, heliports, and seaplane bases) in the state that are not included in the System Plan, some of which are registered with the Division of Aeronautics.

### 4.3 NATIONAL AVIATION TRENDS

The most efficient way to assess aviation trends is to address each component of the industry separately, namely, commercial service, general aviation, and military activity. One overview of the industry is presented in Federal Aviation Administration (FAA) Annual Aerospace Forecasts.

#### 4.3.1 COMMERCIAL AVIATION - NATIONAL TRENDS

Commercial aviation is comprised of passenger airline service provided by major and regional airlines, as well as all-cargo carriers. The airline industry has changed significantly just within the last two years, since September 11, 2001.

##### Major Airlines

Major airlines, as defined by the FAA, are companies that generate more than \$1 Billion in revenue annually, and include passenger operators United, American, Delta, Southwest, Northwest and Continental, and cargo carriers such as FedEx and UPS.

The major airlines experienced unparalleled growth both domestically and internationally between 1993-2001 due to the rapidly expanding economy over a relatively long period, and as a result were very profitable during that period.

However, a combination of factors drastically changed that situation:

- The U.S. and world economies were starting to slow down in early 2001, particularly in the high tech industry, and business travel had already started to decline by September of that year.



- The attacks on September 11, 2001, resulted in the complete shutdown of the aviation system in the US for three days, which had a worldwide impact. In 2001, revenue passenger miles in the U.S. dropped by 5.9%, the largest drop in the industry's history. The U.S. Congress passed emergency legislation providing federal grants to airlines to cover some of the financial impact of the loss of traffic, but that did not cover the full cost to the industry.
- Both the U.S. and many foreign economies went into a deep recession in late 2001 and throughout 2002, significantly decreasing demand for air travel, particularly by business travelers. Over that same period, both labor costs and fuel prices rose sharply, as did security costs, resulting in severe financial losses for airline industry – with the sole exception being low-fare carriers such as Southwest, AirTran, and JetBlue.
- The Air Transport Association (ATA), the airline industry's trade organization, has characterized the state of the industry as of early 2003 as being in a severe crisis. Since September 11, almost 100,000 airline employees have been put out of work, 300 aircraft (6% of the whole fleet) have been grounded, \$5.6B in capital expenditures have been deferred, two major airlines (United and US Airways) have filed for Chapter 11 bankruptcy (others may file for Chapter 11 protection), the industry has lost more than \$18B, and total corporate airline debt has increased to \$100B.
- In 2003, the bad news continued. The stock market continued to decline – as did corporate profits, the U.S. went to war in Iraq, and most recently the outbreak of a worldwide epidemic of Severe Acute Respiratory Syndrome (SARS), have all impacted both domestic and international traffic.

It is interesting to note that in stark contrast to that bad news, low-fare airlines such as Southwest, AirTran, and JetBlue have been profitable over this same period due to several factors: discretionary travel has not declined as much as business travel; some business travelers have switched to low-fare carriers to lower their travel costs; and low-fare airlines have kept their operating costs low, in part by operating new fuel-efficient aircraft and hedging on fuel prices, for example.

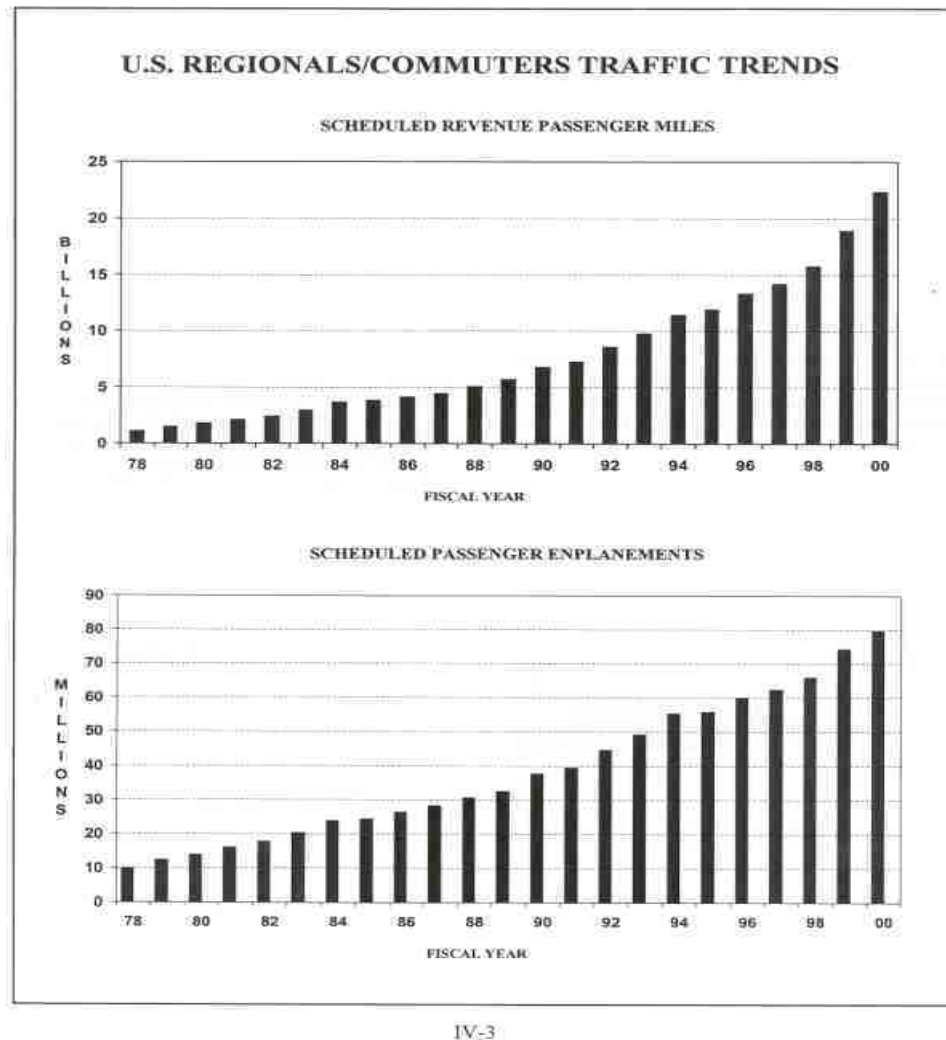
While traffic at Manchester Airport declined in late 2001, it started rebounding in 2002 and has since increased to levels seen before September 11. Part of this growth has come from passengers diverting to Manchester Airport from Boston Logan Airport due to increased convenience and fewer delays. In 2002, there were 3.36 million total passengers at Manchester, a 4.01% increase over 2001. Passenger traffic at Pease International Tradeport remained relatively flat over that period, while Lebanon Airport has seen a steady decline in passenger traffic.

### Regional Commuter Airlines

Between 1993-2001, the growth that occurred in the major airlines was outpaced by the regional (commuter) airline industry. The growth in air travel and the advent of regional jets (particularly the Canadair CRJ-200 and the Embraer ERJ-145) spurred rapid growth in the regional airlines. Figure 4-1 shows the dramatic growth in the regional airlines between 1978 and 2000.

New technology has been one of the major factors in the commuter industry's growth. The industry has traditionally used small 19 to 30 seat propeller-driven (both piston and turboprop) aircraft to move their passengers to and from the hub airports served by major airlines. Passengers were not fond of these aircraft because of their relatively cramped cabins, loud interior noise levels, and safety record, particularly compared to jet aircraft such as the B-737. The airframe manufacturers noted the inherent problems with small turboprop aircraft (Beech 1900, DH Twin Otter, etc.) and developed larger and quieter turboprop aircraft to meet the growing demand for larger aircraft by the commuter operators.

Figure 4-1 – Regional Commuter Historical Growth



IV-3

Source: FAA Aerospace Forecasts 2001-2012

The commuter industry went through an even more dramatic change with the advent of the regional jet. Bombardier Aircraft Company introduced the regional jet in the early 1990's. This aircraft, the CRJ-200, was a converted corporate jet capable of carrying 50 people and flying longer commuter legs (up to 800 – 1,000 miles). Regional jets have revolutionized the industry by providing passengers with the same level of service and comfort as B-737 aircraft. Regional jets have replaced many turboprops on both longer and even

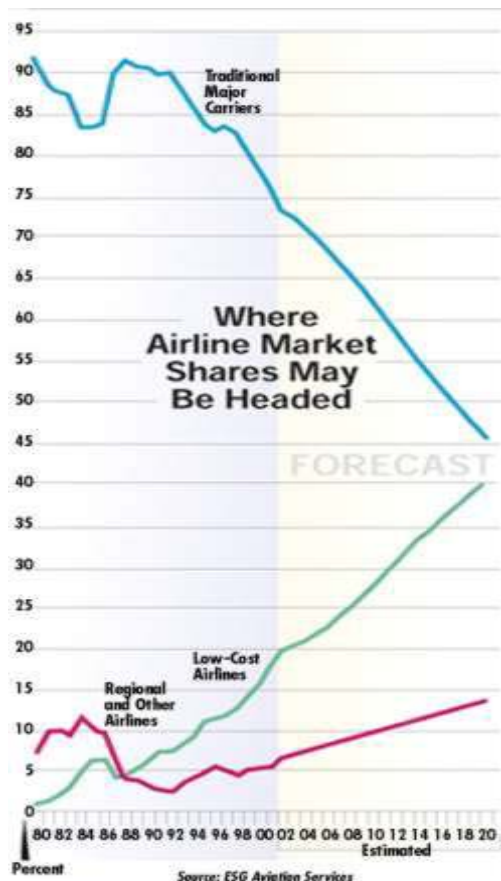


relatively short routes (500 miles and less). Further advancements in regional jet technology have developed a variety of aircraft seating from 30 to 70 people that will ultimately replace most turboprop aircraft in current use. As a result, there are relatively few commuter airlines flying 19-seat Beech 1900 and the 30-seat Saab SF-340. The FAA notes that the number of regional jet aircraft in service in 1996 totaled 90, and by 2000 they had increased to 569 aircraft (see graph).

With the advent of regional jet aircraft, commuter airlines have significantly increased their passenger enplanements, revenue passenger miles, and average stage length flown. This success has spurred a number of consolidations within the commuter industry. In 1990, there were 151 regional and commuter airlines, while in 2001 there were 90.

As the economy grew and enplanement increased in the 1990s, consolidations resulted in larger commuter airlines that served large regions. Most of the regional airlines are associated with or owned by the major airlines. The regional airlines that have been acquired by major airlines include Atlantic Southeast Airlines and Comair, purchased by Delta, American Eagle purchased by AMR Corp., and Allegheny and PSA were purchased by US Airways. FAA notes that the top twenty regional carriers account for almost 98 percent of the total passenger enplanements within the regional/commuter industry. Manchester Airport has experienced an interesting trend with regional carriers starting service to new markets, and that service being taken over by major carriers as traffic increases. As a result, regional airline service has not experienced the same rate of growth at Manchester Airport as it has elsewhere.

Although the factors described above that have significantly impacted major airlines, regional carriers have not been as severely impacted. As part of their downsizing program, major airlines have shifted many of their routes to their regional partners and as a result, regional traffic has not declined as much as it has for the major carriers. FAA forecasts that between 2001 and 2012, the regional airlines will continue to outpace the growth of the major carriers. This will be due in part to transfer of short haul routes (500-1000 nm) from the major airlines to their regional partners, and continued route rationalization by the major airlines that is intended to reduce costs. Over time, the rate of growth will slow as route structures mature and fewer aircraft are acquired. FAA predicts that passenger enplanements will grow 5.6 percent annually through 2012. However, if the economy does not rebound and if fuel prices continue to rise, then it is not likely that growth will be realized.



### Low-Fare Carriers

Throughout the 1990's there were a number of low-fare/low-cost airline startups. The FAA noted that since 1988 there have been 88 new low-cost airline entrants to the market, and as of 2000 there are 17 still operating. Although a number of them have since gone out of business, among the most notable being MetroJet operated by US Airways, the most successful low-fare carriers still operating include Southwest, AirTran, and JetBlue. In addition, Delta announced the formation of new low-fare airline-within-an-airline, named "Song" that will be flying Boeing B-757 aircraft primarily along the East Coast. These carriers provide service at considerably lower cost than service charged by 'traditional' major airlines, and they typically fly point-to-point from small and medium hubs (such as Manchester, Providence, Bradley, etc.). As a result they avoid the congestion and high cost of operating at traditional hub airports such as Boston Logan, Philadelphia, Pittsburgh, etc. FAA has calculated that low cost carriers saved the flying public \$6.3 billion.

The major airlines have attempted to restructure their operations to more effectively compete with the low costs carriers and have, in some cases started their own low-fare airline within an airline, such as Delta Airlines noted above.

However, low-cost/low-fare carriers are gaining market share, while traditional major airlines are losing market share (see graph).

The most successful of the low cost carriers is, by far, Southwest Airlines. Southwest started flying in 1972 in Texas as an interstate airline, and expanded slowly to become a dominant airline in that region. Throughout the 1990's, Southwest expanded its route structure nationally, moving most recently throughout the East Coast, starting an operation centered around Baltimore-Washington Airport (BWI). Once established at BWI, Southwest began service to small- and non-hub airports including Manchester, NH, Providence, RI, Albany, NY, Buffalo, NY, Islip, NY, and Bradley International in Hartford, CT. Since its founding, Southwest has only discontinued service in four markets, has never had an employee furlough or layoff, and has never had an unprofitable year.

When Southwest enters a new market, overall fares often drop significantly and total passenger enplanements increase dramatically. This has been termed "the Southwest Effect", and often occurs during the first 3-5 years after low-fare service starts. One of the effects on airports is an immediate increase in the total number of passengers and often airports must build new facilities in order to meet rapidly increasing demand. All three of the airports in New England with service by Southwest have had to build new terminal space, parking facilities, and other infrastructure improvements to accommodate the demand generated by the 'Southwest Effect'.

### Air Cargo

Air cargo comprises several different types of freight: express package (typically small packages), heavy/bulk cargo, and U.S. mail. All-cargo carriers such as Federal Express, United Parcel Service (UPS), DHL, and Emery, provide both express package and heavy/bulk cargo throughout the United States. The major airlines also carry packages, bulk cargo, and mail through the use of belly space in passenger aircraft (so-called belly-cargo). There are also numerous charter aircraft that provide high priority cargo services (mail, bank checks, just in time cargo) that operate at many of the general aviation as well as the larger air carrier airports.

Air cargo has been one of the fastest growing elements in aviation over the past ten years. From 1990 to 2000, the annual growth rate for cargo carried by commercial airlines has been 6.3 percent, and has outpaced the growth in passenger growth. For all cargo operators (Federal Express, UPS, etc.), that growth has represented 4.9 percent annually. Airports with among the highest growth in cargo operations have been the hubs for Federal Express (Memphis) and UPS (Louisville). Manchester Airport has seen a dramatic increase in air cargo since the early 1990s, driven in large part by FedEx and UPS, both of which have constructed mini-sorting facilities at MHT. Eight all-cargo carriers serve Manchester, and the airport handled over 181 million pounds of freight in 2002, an 8.94% increase over the record numbers attained during 2001.

Manchester Airport has seen a dramatic increase in air cargo since the early 1990s, driven in large part by FedEx and UPS, both of which have constructed mini-sorting facilities at MHT. Manchester is served by six all cargo carriers (United Parcel Service, FedEx, Airborne Express, Telford Aviation, Mountain Air Cargo, and Wiggins Airways), and the airport handled over 181 million pounds of freight in 2002, an 8.94% increase over the record numbers attained during 2001.

Cargo is forecasted to continue to grow both domestically and internationally in the future. The FAA uses revenue ton-miles (RTM) as the unit of measure for cargo activity. Over their 12-year forecast period from 2000 to 2012, domestic freight and express revenue-ton-miles will increase from 12.1 billion to 22.2 billion RTMs by 2012. This represents an annual average increase of 5.2 percent over the forecast period. FAA also indicates that much of the growth will occur for the all-cargo carriers such as Federal Express and United Parcel Service. Belly cargo for the airlines will increase at a lesser rate.



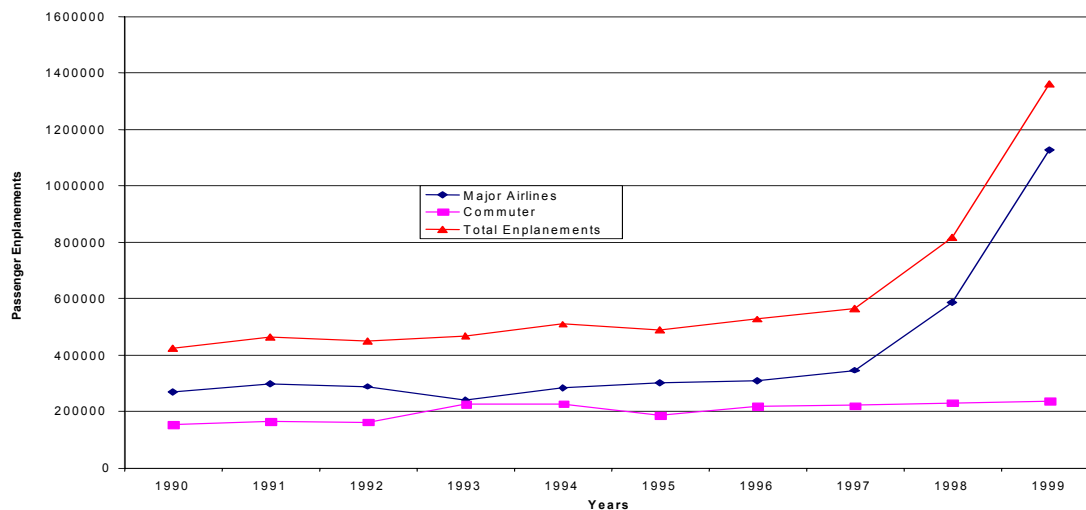
## 4.3.2 COMMERCIAL AVIATION – STATEWIDE TRENDS

### Passenger Service

There are three airports in New Hampshire that have commercial airline service; Manchester, Pease International Tradeport, and Lebanon. Section 2.7 in Chapter 2 provided a detailed description of past and present service provided at these airports and within the state. As was discussed earlier, air service in the state has changed significantly over the past 30 years. Airports such as Laconia, Concord, Berlin, and Dillant-Hopkins had scheduled air service in previous years, but as the airline industry changed, service was dropped or shifted to other airports in the state. Today, Manchester Airport accommodates the large majority of passengers and airline service in the state.

Since 1990, airline service has grown dramatically in the state, particularly since 1998. In 1981, after Delta Airlines withdrew service, Manchester had less than 43,000 enplanements. Passenger growth started at Manchester when United Airlines jet service to Chicago O'Hare in 1984 and shortly thereafter by US Airways initiating jet service to Philadelphia and Pittsburgh in 1986. As traffic continued to grow, Manchester Airport opened the new terminal building in 1994, and in 1998, Southwest, Metrojet, Northwest and Continental Airlines all started service. Figure 4-2 summarizes the passenger enplanement trends in the State.

**Figure 4-2 - Passenger Enplanements – Manchester Airport: 1990-1999**



Source: FAA Terminal Area Forecast

For a two-year period, Manchester had the highest growth rate of passenger enplanements of any airport in the country, and as of early 2003, growth continues, albeit at a slower rate as the market matures. Manchester Airport has exceeded the passenger levels needed to be classified as a medium-hub airport, and based on projections prepared for airport bond documents, passenger enplanements could increase to 2 million per year by 2010.

Since MetroJet discontinued service in 2001, Southwest has increased its market share at Manchester Airport, and as of late 2002, captured approximately 40% of the passenger traffic. Based on the projected growth of low-fare service nationally, it is anticipated that Southwest will continue to increase their market share at Manchester throughout the forecast period, and that other low-fare airlines, such as JetBlue, may start service at Manchester as well.

In response to the rapid growth in air service throughout the 1990s, as well as the anticipated growth over the next decade, Manchester Airport has undertaken a major expansion program, the major components of which include:

- Reconstructing and extending both runways. Runway 17-35 will eventually be 9,250 feet long, and will be able to accommodate non-stop, trans-continental and Trans-Atlantic service. In addition, a Category IIIB precision instrument approach (ILS) is being installed to Runway 35, which allow much greater reliability in airline service.
- The existing 228,000 square foot passenger terminal is being expanded by approximately 70,000 square feet. The addition includes four new jet gates, ticket counters, baggage claim and new food/gift concessions. Construction started in spring 2003 and is scheduled to be completed in the fall of 2003.
- A six-level parking garage has been constructed in front of the terminal. The 4,800 space parking structure includes 4,000 public parking spaces and 800 rental car spaces. The airport also constructed a 520 foot long elevated pedestrian walkway connecting the parking garage to the passenger terminal. The project included "moving sidewalks" to conveniently move passengers between the garage and the terminal.
- Manchester Airport opened a portion of its new multi-lane entrance roadway that further improves traffic flow and access to the airport. The new airport entrance road design includes a new Brown Avenue intersection and a connecting point for the NHDOT Airport Access Road project. NHDOT continues to move ahead with the Airport Access Road project connecting Manchester Airport to the F.E. Everett Turnpike. NHDOT officials expect to have the new road open in 2006.
- The Federal Aviation Administration (FAA) plans to construct a new 160-foot air traffic control tower at Manchester Airport in 2004. The new tower will be three times as tall as the existing.
- To date, over 650 eligible homes located in neighborhoods surrounding the airport have received sound insulation modifications under the Residential Sound Insulation Program. Manchester Airport has spent more than \$20 million on the program, and improvements have included:
  - replacing existing windows with double-pane acoustical window units
  - replacing existing exterior doors with 1 3/4" solid-core doors
  - wall and ceiling modifications
  - installing extra layers of insulation in attics and crawl spaces
  - installing central air conditioning

Once the current expansion program has been completed, additional terminal expansion phases are anticipated, as well as a second parking garage.

Since its conversion to a civilian airport, Pease International Tradeport has completed \$26 million in infrastructure improvements (pavement, electrical, & facilities) in the past seven years. During that period, Pease International Tradeport also accommodated both passenger and cargo airlines. Pease International Tradeport served as the base of Business Express before it was acquired by American Eagle, and currently serves as the base of Pan Am (Boston-Maine Airways). Pease International Tradeport is situated within the market area of three other commercial service airports: Manchester, Boston Logan, and Portland Jetport, with good highway access to all three airports. The existing low-fare service by Pan Am is point-to-point versus hub-oriented, and is focused on discretionary versus business travelers. Pan Am operates B-727 and Jetstream J-31 aircraft for passenger service. In 2001 there were 37,235 passenger enplanements, which was a small decrease from 2000 (37,786).

Lebanon Airport is also impacted by similar factors as Pease International Tradeport because it too is situated within the market area of four other airports: Manchester, Bradley Field CT, Boston Logan (primarily for international service), and Burlington, VT. Passenger enplanements at Lebanon have declined steadily since 1993.

### Air Cargo

Air cargo in New Hampshire has grown significantly in the past ten years, however, it has been primarily at Manchester Airport. Manchester has traditionally had the air cargo operators in New Hampshire, namely Federal Express and UPS. Over the past seven years, both Federal Express and UPS have significantly increased their storage and sorting facilities, making them regional facilities for express package collection and distribution. They have also increased the size and number of aircraft they use. Federal Express used primarily narrow-body Boeing B-727s throughout most of the 1990's, but now use wide-body Airbus A300s supplemented by DC-10s. Regional companies under contract to FedEx use Cessna Caravan and Beech 99 turboprops to move express packages within the region, with scheduled flights to airports in Maine and Vermont. UPS also operated B-727s and DC-8s at Manchester for a number of years, but now operates B-757s, B-767s, and A-300 aircraft. Airborne Express also operates DC-9 aircraft at Manchester.

### **4.3.3 GENERAL AVIATION – NATIONAL TRENDS**

General Aviation (GA) comprises all civilian aviation activities except for commercial airline service. GA includes a wide variety of activities, such as personal/recreational, flight training, sightseeing, aerial patrol, filming and photography, utility/construction support, electronic news gathering, law enforcement, , aerial ambulance, business and corporate flying. GA aircraft range from single and multi-engine piston aircraft, to corporate jets, helicopters, gliders, balloons, and experimental (homebuilt) aircraft. There are more than 16,000 airports in the U.S., all of which accommodate general aviation aircraft, however, the scheduled airlines only serve 500 of those airports. GA also has a significant economic impact on the nation. The FAA completed an economic benefit study of GA activity and concluded that general aviation generated \$64.5 billion for the national economy annually, and represented 6.6 percent of the aviation industry's total contribution to the economy.

GA activity has historically exhibited cyclical trends during which activity has risen and declined with changing economic times. GA pilots and passengers are relatively price sensitive since a large portion of GA flying is dependent upon personal disposable income.

The cyclical nature of the industry can be seen most graphically in terms of aircraft deliveries. While the GA industry as a whole rebounded with the strong national economy in the mid to late 1990s, due in part to factors such as record low unemployment rates and rising per capita income.

### **4.3.4 GENERAL AVIATION – NH TRENDS**

New Hampshire has seen a reduction in statewide general aviation activity over the past ten years. Although there is a lack of historical data to accurately track GA activity in the state, two sources indicate that activity levels in the state have declined. First is the comparison between the statewide activity levels noted in the last State Airport System Plan (1990) compared to data compiled by the Division of Aeronautics in the year 2000, clearly indicates that GA aviation activity has decreased.



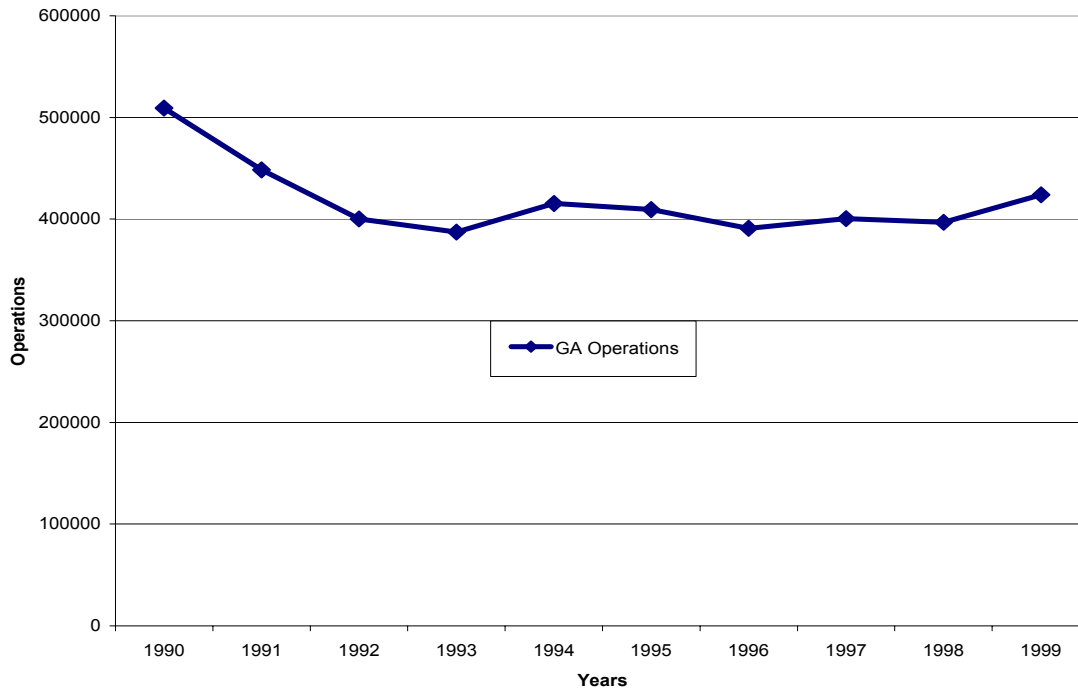
| <b>Table 4-1 – NH General Aviation Activity- 1990-1999</b>             |                |                |                 |
|--|----------------|----------------|-----------------|
| <b>Region</b>  | <b>1990</b>    | <b>2000</b>    | <b>% change</b> |
| Central  | 48,929         | 56,700         | 15.9%           |
| Lakes  | 91,254         | 54,503         | -40.3%          |
| Nashua   | 112,191        | 101,633        | -9.4%           |
| North Country  | 43,079         | 33,250         | -22.8%          |
| Rockingham   | 39,001         | 62,366         | 59.9%           |
| South  | 95,525         | 45,740         | -52.1%          |
| Southwest  | 76,813         | 66,442         | -13.5%          |
| Strafford  | 23,736         | 18,592         | -21.7%          |
| Upper Valley   | 74,355         | 58,938         | -20.7%          |
| <b>Total Operations</b>  | <b>604,883</b> | <b>498,164</b> | <b>-17.6%</b>   |
| Sources: 1990 NH Airport System Plan 2000 data Division of Aeronautics |                |                |                 |

The second source of historical information used was the FAA Terminal Area Forecast (TAF). FAA records are consistent with the findings shown in Table 4-1. Table 4-2 presents annual activity levels between 1990–1999, which is also depicted in Figure 4-3. Table 4-3 shows the percent change in local and itinerant operations between 1990 and 1999.

| <b>Table 4-2 – NH General Aviation Operations</b> |                     |                 |                 |
|---|---------------------|-----------------|-----------------|
| <b>Year</b>                                       | <b>GA Itinerant</b> | <b>GA Local</b> | <b>GA Total</b> |
| 1990  | 256,553             | 252,521         | 509,074         |
| 1991  | 223,513             | 224,988         | 448,501         |
| 1992  | 199,919             | 200,266         | 400,185         |
| 1993  | 203,413             | 183,782         | 387,195         |
| 1994  | 214,784             | 200,398         | 415,182         |
| 1995  | 214,455             | 195,026         | 409,481         |
| 1996  | 193,613             | 197,398         | 391,011         |
| 1997  | 194,323             | 206,255         | 400,578         |
| 1998  | 194,260             | 202,465         | 396,725         |
| 1999  | 199,161             | 224,798         | 423,959         |
| Source: FAA 5010                                  |                     |                 |                 |

| <b>Table 4-3 – Change in Local and Itinerant Operations</b> |             |             |                 |
|---|-------------|-------------|-----------------|
|   | <b>1990</b> | <b>1999</b> | <b>% change</b> |
| <b>GA Itinerant</b>   | 256,553     | 199,161     | -22%            |
| <b>GA Local</b>   | 252,521     | 224,798     | -11%            |
| <b>Total</b>  | 509,074     | 423,959     | -17%            |
| Source: FAA 5010  |             |             |                 |

Figure 4-3 – TAF GA Activity Summary: 1990-1999



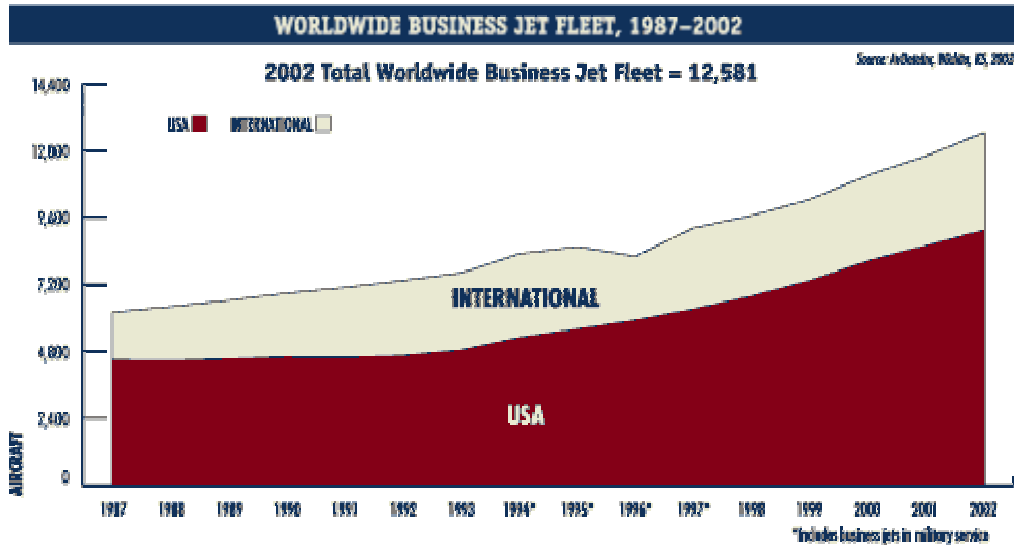
Source: FAA Terminal Area Forecasts

The airport site visits completed as part of the inventory process provided a clearer understanding of how the trends in GA activity have affected the airports within the state. The majority of airport managers that were interviewed indicated that their number of operations and based aircraft had remained steady or increased between 1997 – 2000. This appears to be supported by FAA’s TAF data that indicates an increase of activity in 1998 and 1999. It is interesting to note that between 1992 – 1997, overall GA activity declined even while the state’s economy was growing at a rapid pace. The upturn in GA activity since 1998, however, indicates that the robust economy is finally having a positive impact on GA traffic and demand.

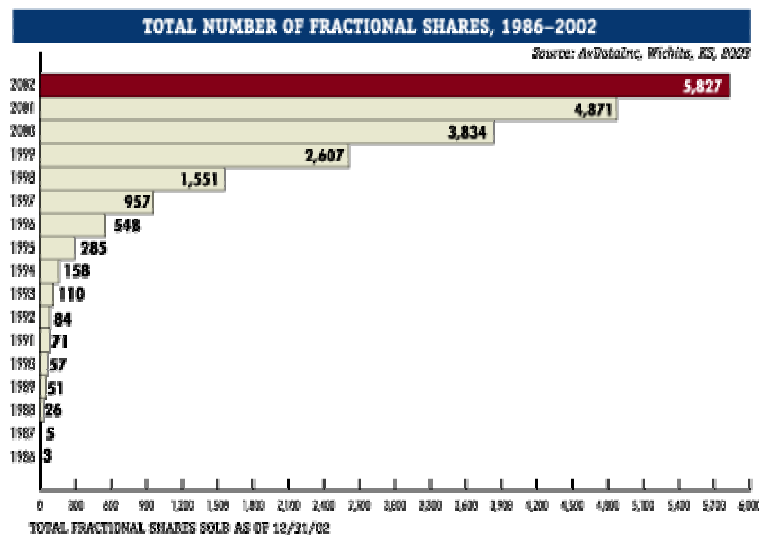
Corporate activity appears to be the strongest segment of GA activity in the state, both in terms of based aircraft as well as transient operations. Corporate activity is strongest at airports in the southern portion of the state: Manchester, Boire Field, Concord, Dillant-Hopkins, Lebanon, Laconia, and Pease International Tradeport. There are several reasons for that:

- As noted previously, the state’s population, employment, and business establishments are concentrated in the southern portion of the state;
- Those airports have the necessary facilities (such as runway length, terminals, and hangars), services (fuel, ground transportation, etc.), and instrument approaches to accommodate corporate aircraft;
- Fixed base operators (FBO) actively market and solicit corporate traffic at those airports.

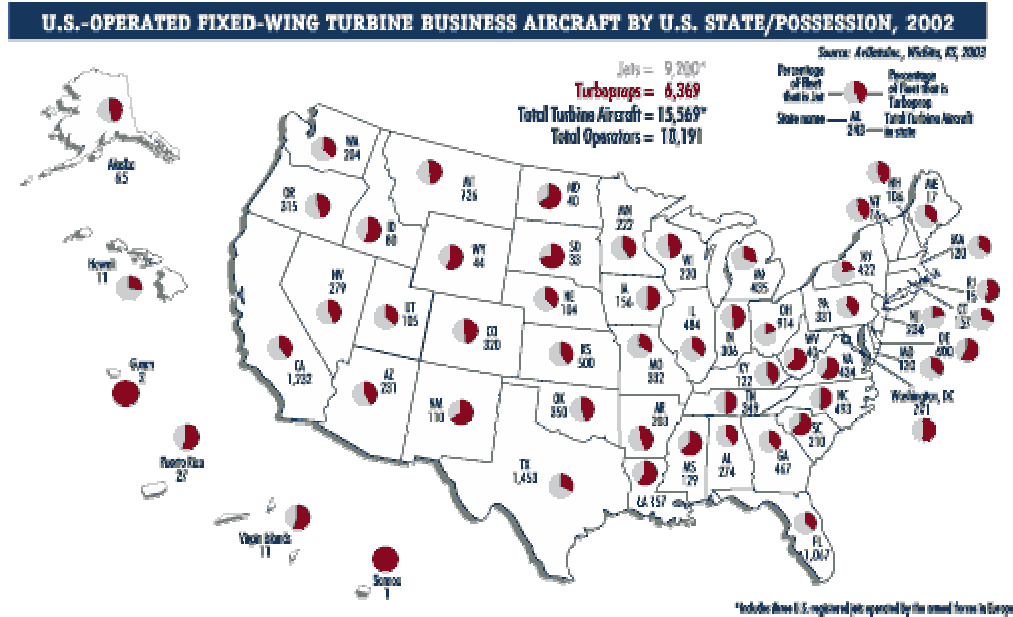
The number of corporate jets has increased steadily since 1987, particularly in the U.S. (see following chart). According to the National Business Aircraft Association (NBAA), there were 15,569 corporate turbine-powered aircraft in the U.S. in 2002, 106 (0.7%) of which were based in New Hampshire.



Between 1992-2001, there were three primary factors that stimulated corporate aircraft activity, nationally and in New Hampshire. First and foremost was the steady rise of the stock market and corporate profits until early 2001. Rising stock prices and corporate profits provided the financial resources for companies to own and operate aircraft. Second was the advent of fractional aircraft ownership (see chart below), in which the cost of owning and operating an airplane was divided among a number of firms. Third, delays at airline hub airports increased dramatically, as did airline ticket prices, and the level of service provided by airlines deteriorated, providing strong incentives for business travelers to find alternatives.



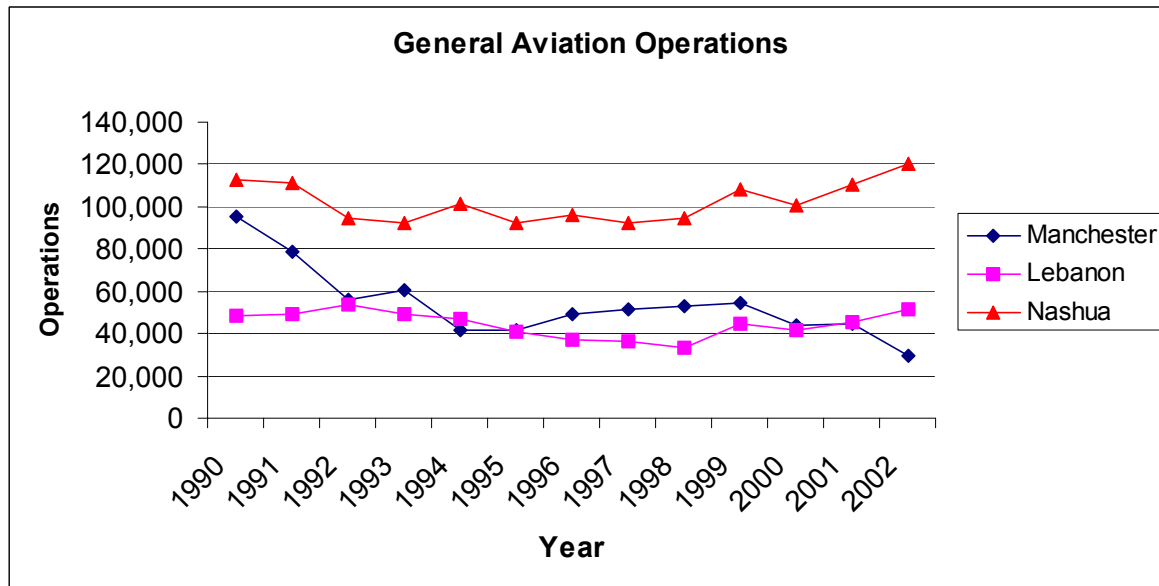
Locally, the lack of a state sales tax was also a strong incentive for corporate and business airplane owners, particularly in Massachusetts, to base their aircraft in New Hampshire. In early 2002, Massachusetts exempted aircraft and parts from the state sales tax in an effort to prevent further airplanes from being based out-of-state.



#### 4.3.5 CURRENT EVENTS AFFECTING GENERAL AVIATION

By the end of 2002, there were three significant events that directly impacted the General Aviation industry, including corporate aviation:

- The rapid downturn in the economy, which was greatly exacerbated by the dramatic downturn in the stock market. The U.S. was in an economic recession in late 2001 and early 2002, and the subsequent recovery has been extremely weak, with unemployment and the national budget deficit continuing to grow. The economic recession in the US impacted the rest of the world, and as a result demand for American goods and services has decreased significantly, and international travel has greatly declined. U.S. and international corporate profits have plummeted, and combined with the drop in the stock market, demand for general aviation has been declining rapidly. This is evidenced by declines in new aircraft deliveries, cutbacks in GA aircraft production, and reductions in GA manufacturing employment.
- The terrorist attacks on the U.S. on Sept. 11, 2001, the subsequent international war on terrorism, and the new airport and airspace security procedures, have all combined to dampen demand. Most of the airport security regulations were targeted at commercial service versus general aviation airports, and the increased passenger scrutiny initially provided a stimulus for corporate aviation. However, recurring airspace restrictions, some of which have become permanent, including lack of GA access to Reagan National Airport for example, and new proposals by the Transportation Security Administration (TSA) to screen corporate aircraft passengers, all have had a negative impact on GA activity. Additionally, states such as New Jersey, Massachusetts, Florida, and Michigan, among others, have adopted their own security procedures for GA airports, aircraft, and pilots, and most recently, Mayor Richard Daley unilaterally closed Meigs Field, a GA airport located near downtown Chicago, citing security concerns.
- Dramatically rising fuel prices and insurance rates. Coinciding with the impacts described above, aircraft operating costs have been rising as well, driven primarily by rising fuel and insurance costs. Historically, those costs have been cyclical and as a result they may decrease again, however, the cost of new aircraft and operating expenses have been increasing significantly faster than the consumer price index (CPI).



Source: FAA Air Traffic Control Tower Records

General aviation operations at three airports in New Hampshire, as shown above, have remained relatively steady since the mid-1990s, although there was a drop at Manchester Airport in 2002, part of which might be attributed to the on-going construction program during which one runway was closed for much of that year. Operations at Boire Field have actually increased over the last several years, representing one of the few airports that has experienced an increase.

#### 4.4 AIRPORT USER SURVEYS

A number of New Hampshire airport user surveys were developed to obtain additional information on how airports and aircraft are used in New Hampshire. Three separate user surveys were developed for this study: an aircraft owner survey, an itinerant aircraft survey, and a business survey. These surveys were designed to document out how aircraft owners and users, and businesses within the state, use the system of airports in New Hampshire. Some of the specific issues addressed in the surveys were:

- Ownership of the aircraft
- Specific use(s) of the aircraft (e.g. recreational, business, etc.)
- Where maintenance and fuel services are purchased
- Use of specific facilities at an airport such as parking aprons, hangars, etc.

The surveys were used as an indicator of activity and preferences as opposed to a statistical survey. As such, the results of the surveys were not used to adjust forecasts of activity but were used to identify issues support the forecasting effort. The results of the surveys are detailed in the following sections.

##### 4.4.1 AIRCRAFT OWNER SURVEY

The purpose of this survey was to document the types of aircraft operated, the types of missions flown, and what facilities and services were used at airports around the state. The survey also provided information on where aircraft owners purchase fuel and have their maintenance completed. A copy of the survey form and the detailed results are provided in Appendix 4-A.



The list of aircraft owners was obtained from the Division of Aeronautics. Six hundred surveys were sent to owners that represented a mix of aircraft from small single engine aircraft to corporate jets and helicopters. There were 135 surveys responses received and adjusting for surveys returned undeliverable, the response rate was 28%, which was very good.

The results of the aircraft owner survey are summarized below:

- Owners of single and multi-engine aircraft represented 90 percent of the survey responses, while owners of turboprops, jets, and helicopters represented the remaining 10 percent.
- Aircraft ownership was split 77% private/joint ownership, and 23% owned by businesses. The businesses ranged from small private business owners to large corporations. Additionally, business aircraft ranged from small single engine aircraft to corporate turboprop and jet aircraft.
- 68% of the aircraft owners used their aircraft for recreational purposes, and 27% of the owners used their airplanes for business purposes. The remaining 5% was for 'other' purposes.
- Owners indicated that 80% of the aircraft maintenance was performed in-state, from which three conclusions were drawn: a) existing services within the state are adequate to meet the maintenance requirements of aircraft owners; b) the high percentage of maintenance performed in-state greatly supports local FBOs and airports; c) there is no significant price or service differential with out-of-state operators drawing significant maintenance business out-of-state.
- Owners indicated that 92% of their fuel was purchased in-state, which indicates that fuel prices are in line with surrounding states, and New Hampshire is not losing potential fuel revenue to out-of-state airports. Several airports in NH (Dillant-Hopkins, Silver Ranch in Jaffery, and Boire Field) derive some of their fuel sales from airplanes based in neighboring states due to favorable price differential.

#### 4.4.2 ITINERANT AIRCRAFT SURVEY

An itinerant (or transient) aircraft is one that operates at an airport on a temporary basis and is not based at that airport. Surveys were sent to several general aviation airports in the state that were representative of varying sizes and activity levels in the state. Airport managers were asked to distribute the surveys to itinerant aircraft pilots at their airports. A copy of the survey and detailed results are provided in Appendix 4-B.

Twenty-five surveys were completed and returned, which represented small single and twin-engine aircraft and several corporate jet aircraft. Aircraft usage included recreational, business, and training. The data was segregated into two groups, small single engine aircraft, and twin engine and jet aircraft. This was done for several reasons. The small single engine aircraft were used for both recreational and business usage and it was felt that this point is an important point to identify. Second, ownership of the aircraft was another point that needed to be identified, since there are small businesses that use single engine aircraft as a means of transportation for their businesses. For the jet aircraft, it was important to identify where they were flying from in order to understand how corporate aircraft are used. The results of the surveys are summarized below by type of aircraft operated.

##### *Single Engine Aircraft*

- 16 aircraft privately owned, four were owned by businesses, and one that was a rental aircraft.
- Seven aircraft flew from outside New England while 14 flew from New England states.
- Of the 16 privately owned aircraft, eight (50%) were used for recreation while the other eight (50%) were used for business purposes.
- The average dollars spent for trip for the privately owned aircraft was \$65.

- Aircraft businesses owners included an FBO, an engineering company, and privately owned company, and an aerial advertising company.
- The average dollars spent by the business owned aircraft on business trips was \$318

A key finding of the survey was that the average dollars spent by similar types of aircraft on business trips is almost 400% greater than the amount spent by aircraft owners on recreational trips.

#### Multi-Engine and Corporate Jet Aircraft

- All four survey respondents said that their aircraft were used for corporate transport
- Two jets were fractional ownership aircraft, a rapidly growing sector in business aviation
- Most of the flights originated in the United States, although one aircraft flew from Bermuda
- Two of the four respondents indicated they spent an average of \$2,000 per trip, a major portion of which includes fuel (Jet A).

It is apparent that the amount of money spent by corporate aircraft operators is much greater than by operators of piston-engine airplanes, and that corporate operators represent a potentially significant source of revenue for FBOs and airports.

#### **4.4.3 BUSINESS SURVEY**

When analyzing the impact of airports on local, regional, and state economy, it is important to understand the linkages, if any, between airports and local (non-aviation) business establishments. Several aspects of such linkages and impacts include the types of airports (commercial or general aviation) used by businesses, the frequency and type of use (passenger or cargo), the importance of corporate or charter aircraft for businesses, and the importance and influence of airport facilities in business site selection. In an effort to gauge these impacts and define the linkages, a questionnaire was distributed to approximately 1,400 business establishments across New Hampshire. The questionnaire and detailed results are provided in Appendix 4-C.

The Business and Industry Association of New Hampshire (BIA), the Nashua Chamber of Commerce and the Mt. Washington Valley Chamber of Commerce distributed the questionnaires through a combination of email, fax and mail-out distribution methods.

The purpose of the survey was not to statistically define the economic relationship between airports and businesses, but rather to describe the characteristics of the existing relationship. The survey results indicate that businesses primarily use airline services at Manchester Airport, and secondarily use corporate aviation at Lebanon and Pease International Tradeport, as well as the larger general aviation airports such as Boire Field, Concord, Dillant-Hopkins, and Laconia for business purposes. Specifically, there appears to be a direct connection between businesses and Manchester Airport, and an indirect connection between businesses and most general aviation airports. When respondents think of airports, by in large, they think of Manchester Airport. For example, when asked to name the nearest general aviation airport, one-third of respondents stated that Manchester Airport was the closest – which is unlikely given that only 9% of respondents were from the Manchester area. This finding is further substantiated by over 93% of respondents indicating that they use one of New Hampshire's commercial airports for business purposes (with 76% indicating they use Manchester Airport). The results indicate two possible recommendations. First, standardized data and information for each airport in the state is desperately needed. Second, it appears that outside of an awareness of Manchester Airport (and possibly to a lesser extent Pease International Tradeport and Lebanon) there is an apparent lack of knowledge within the business community relative to local airports. Their awareness of GA airports could potentially be increased with focused promotional and outreach efforts by the airports and the Division of Aeronautics.

Respondents overwhelmingly indicated that businesses use commercial airports to transport people rather than material, products or receive supplies. Approximately 77% of the respondents who use one of New Hampshire's commercial airports indicated that they use facility for the transportation of staff and clients. Only 16% of respondents indicated that they use commercial airports for delivering products or receiving supplies.

In order to gauge the importance of airports in business location decisions, businesses were asked to rank commercial airport accessibility within a list of site selection criteria. Responding businesses indicated that although commercial air travel is crucial to their business, commercial airport accessibility was not a consideration in locating their business and was ranked ninth out of ten respective site selection criteria. Factors such as a skilled labor force, the availability of land, and access to highways were top site selection criteria for businesses. This finding is further substantiated by 46% of respondents indicating that if their nearest general aviation airport were no longer available for use, they would simply go to the next closest airport. No respondents indicated that they would go out of business if the airport they use for business were no longer available.

### Findings

Forty-five business establishments responded to the survey, indicating a response rate of approximately 3.2%. Business establishments responding had an average of 47 years in business and 39 years at their current or responding location, which indicates that although the survey response rate was low, responses were from an experienced establishment base. The sample of responding businesses ranged from very small consulting operations (with 1 employee) to very large multi-national corporations with thousands of employees. The average respondent has approximately 490 employees, however, it should be noted that this value includes several large employers (Dartmouth Hitchcock Medical Center and the University of New Hampshire), which skews with average-per-establishment total employment value upward. A summary of the findings is as follows:

- Businesses from all economic regions responded, however, most came from the North Country (24%), Nashua (20%), and Rockingham (11%) regions;
- Approximately one third (31%) of respondents were service establishments while durable and non-durable goods manufacturers comprised 24% and 13% respectively;
- None of the responding businesses were directly aviation related;
- One third (33%) of respondents indicated that Manchester Airport was the nearest general aviation airport to their business. This suggests that even though many general aviation facilities exists across the state (even in the “backyard” of respondents), Manchester Airport is perceived as the primary aviation facility in New Hampshire;
- Only one respondent was located on an airport facility. 36% indicated that they were within 11 to 25 miles of an airport while 18% indicated that they were over 25 miles away from an airport;
- 62% of responding businesses indicated that they use their local airport for business purposes (although one third of respondents indicated that their local airport was Manchester Airport);
- For establishments that use their local airport, approximately one quarter (24%) indicated that they use the facility 11 times or more annually;

- Approximately 70% of respondents indicated that they do not charter, own or rent corporate aircraft. For the respondents who use corporate aircraft, a variety of airports were listed as being utilized (Pease International Tradeport, Dillant-Hopkins, Lebanon, Skyhaven, Berlin) however, Manchester Airport and Concord Municipal Airport were sighted the most;
- Those respondents who charter or lease aircraft, approximately 60% take fewer than 5 trips annually;
- Businesses appear to rely heavily on commercial airports (primarily Manchester Airport) as a mode to reach clients with 47% using commercial facilities 11 or more times per year;
- Only 26% of respondents indicated that accessibility to commercial airports was either “very important” or “important” in terms of locating their business. The following are the top ten criteria listed as either “very important” or “important” for businesses selecting the current location for their business establishment:
  - 1) Skilled labor;
  - 2) Availability of land;
  - 3) Highway accessibility;
  - 4) Labor Costs;
  - 5) Close to population centers;
  - 6) Location (good exposure);
  - 7) Construction costs;
  - 8) Tax exemptions;
  - 9) Commercial airport accessibility;
  - 10) State and local incentives.

#### Tourism Related Establishment Survey Introductions And Summary

It is estimated that approximately 8% of the state GDP is generated by, and 64,000 individuals are employed within New Hampshire’s tourism industry. Therefore, identifying the economic impact and linkage between those industry and local airports is important to regions with large tourism-based economies. In order to identify the link, if any, between tourist destinations and local airports, a survey of tourism-related businesses establishments was distributed through Ski New Hampshire (SkiNH) – an association representing ski resorts and tourism establishments in central and northern New Hampshire. In an effort to gauge the linkage and potential impacts, questionnaires were e-mailed to all 15 of SkiNH members.

Although many ski resort operators are unclear as to how their customers arrive at their establishment, the results of the survey indicate that those who travel to New Hampshire to ski usually access their destinations via automobile. For example, three quarters of the respondents indicated that the automobile was the most common form of transportation used by their customers. Furthermore, 50% of respondents indicated that between 1% and 10% of their customers fly into a New Hampshire airport in order to utilize their facility. Interestingly, when asked what types of airports are used by those customers who choose to fly, half indicated that commercial service airports are used (primarily Manchester Airport and Boston/Logan). None of the respondents indicated that general aviation airports are used, and none could provide the names of any general aviation facilities used by customers using their establishment.

Surveys conducted for the Division of Travel and Tourism Development have documented that the large majority of tourists visiting New Hampshire come from New England, New York, and Eastern Canada, and drive to the state, as opposed to fly in commercially or via general aviation. As a tourist destination, New Hampshire is different than other large seasonal tourist destinations such as the ski resorts in the Rocky Mountains, and major cities on the West Coast, where large percentages of their visitors travel via airlines.

Although it appears that airports are not a significant access point for tourists utilizing New Hampshire's ski destinations, it is unclear as to the perceived importance of airports by resort operators. When asked about the importance of New Hampshire's airports in bringing customers to their establishment, 50% indicated that airports were "important". However, 25% indicated that airports were "unimportant". Furthermore, respondents were split 50/50 when asked if the potential exists to use their local airport as a vehicle to bring more customers to their resort. Therefore, although a small sample of resort operators was used, indications are that the majority of tourists traveling to New Hampshire to ski use the automobile as their primary source of transportation while a very small number use air travel. This is in sharp contrast to Vail-Beaver Creek (Colorado) ski region in which an estimated 80% of tourists fly into the region to ski.<sup>1</sup> This heavy reliance on air travel could be attributed to relative distance of the region to large population centers which is in sharp contrast to New Hampshire's ski areas.

### Findings

A total of 4 business establishments responded to the survey, indicating a response rate of approximately 27%. All of the respondents are ski resort operators located in the North Country region and have been in operation for an average of 42 years. All of the respondents experience great fluctuations in employment due to the seasonal nature of skiing, however, each resort can employ between 30 and 600 during peak season. A summary of the findings is as follows:

- 100% of respondents indicated that 75% or more of their sales are tourism-based;
- Similar to the results of the business survey outlined previously in which respondents correlated New Hampshire airport activity to Manchester Airport, 25% of respondents indicated that Manchester Airport was the nearest general aviation facility. However, 2 respondents indicated nearby general aviation facilities (Berlin Airport and Whitefield Airport);
- 50% of respondents indicated that they do not use their local general aviation airport for business purposes;
- 75% of respondents indicated that they use one of New Hampshire's commercial airports with most using Manchester Airport. Again, in a similar fashion to the business survey, 75% of respondents indicated that they use the commercial airport for transporting staff;
- Use of commercial airports by resort personnel is common but is not relied upon as other businesses do. 50% of respondents indicated that they use a commercial airport between 1 and 5 times annually.

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<sup>1</sup> Based on current estimates provided by the Vail-Beaver Creek Tourism and Convention Bureau.